CLAIMS

1. A foam molding method for foaming a foamable material, comprising the steps of:

providing a mold having a cavity;

placing the cavity of the mold under a pressurized condition;

foaming the foamable material in the cavity of the mold under the pressurized condition, to thereby appropriately control foaming of the foamable material; and

releasing the pressurized condition of the cavity of the mold.

2. A foam molding method according to claim 1, wherein said placing step includes a step of hermetically closing the cavity of the mold.

3. A foam molding method according to claim 2, wherein said placing step includes a step of injecting the foamable material after or simultaneously with said hermetically closing step.

4. A foam molding method according to claim 2, wherein said placing step includes a step of supplying a predetermined gas to the hermetically closed cavity after or simultaneously with said hermetically closing step.

5. A foam molding method according to claim 2, wherein said placing step includes said step of supplying a predetermined gas to the hermetically closed cavity after or simultaneously with said hermetically closing step, and

a step of injecting the foamable material.

6. A foam molding method according to any one of claims 1 to 5, further comprising a step of controlling the pressurized condition of the cavity to a predetermined level.

7. A foam molding method according to claim 6, wherein said controlling step is commenced when the pressurized condition of the cavity reaches a predetermined level.

8. A foam molding method according to claim 6, wherein said controlling step is commenced when the foamable material is started to be supplied to the cavity.

9. A foam molding method according to any one of claims 6 to 8, wherein said controlling step includes a step of discharging a gas in the cavity of the mold to the outside.

10. A foam molding method according to any one of claims 6 to 9, wherein in said controlling step, a pressure in the cavity of the mold is controlled to 0.1 Kg/cm^2 or more.

11. A foam molding method according to any one of claims 2 to 10, wherein said releasing step includes a step of opening the hermetically closed cavity of the mold.

12. A foam molding apparatus comprising:

a mold having a cavity;

injection means capable of injecting a foamable material into the cavity of the mold;

pressurizing means adapted to pressurize the cavity of the mold; and

controlling means adapted to control a pressure in the cavity of the mold so as to adjust foaming of the

foamable material injected into the cavity by the injection means.

13. A foam molding apparatus according to claim 12, wherein said pressurizing means includes means which supplies a predetermined gas to the cavity of the mold.

14. A foam molding apparatus according to claim 12, wherein:

said mold includes a tube passage for allowing communication between the cavity of the mold and external air, and a discharge valve for opening and closing the tube passage; and

said pressurizing means controls said discharge valve so as to enable the cavity to be hermetically closed before or simultaneously with, or during injection of the foamable material, to thereby place the cavity under a pressurized condition.

15. A foam molding apparatus according to claim 12, wherein:

said mold includes a tube passage for allowing communication between the cavity of the mold and external air, and a discharge valve for opening and closing the tube passage; and

said controlling means controls the pressure in the cavity of the mold to a predetermined level by appropriately opening or closing the discharge valve.

16. A foam molding apparatus according to claim 15, further comprising a pressure gauge for measuring the pressure in the cavity of the mold, wherein said

controlling means automatically opens or closes said discharge valve, based on results of measurement conducted by said pressure gauge, to thereby control the pressure in the cavity of the mold to the predetermined level.

17. A foam molding apparatus according to claim 15 or 16, further comprising a flowmeter for measuring a flow rate of the foamable material flowing into the cavity of the mold, wherein said controlling means automatically opens or closes said discharge valve, based on results of measurement conducted by said flowmeter, to thereby control the pressure in the cavity of the mold to the predetermined level.

18. A foam molding apparatus according to claim 17, wherein said controlling means automatically opens or closes said discharge valve simultaneously with, or before or after starting injecting the foamable material into the cavity of the mold, to thereby control the pressure in the cavity of the mold to the predetermined level.

19. A foam molding apparatus according to any one of claims 15 to 18, wherein said predetermined level is 0. 1 Kg/cm^2 or more and equal to or lower than a pressure of injection of the foamable material.

20. A foam molding apparatus according to any one of claims 14 to 19, wherein said tube passage is provided in a region in the cavity of the mold that is finally filled with the foamable material which has been foamed.

21. A foam molding apparatus according to claim 20, wherein:

the cavity of the mold has an elongated form extending in one direction; and

said injection means is provided on one end of the mold in a longitudinal direction thereof, said tube passage being provided on an opposite end of the mold.

22. A foam molding apparatus according to any one of claims 12 to 21, wherein said injection means includes a mixing device for mechanically mixing a material to be foamed with gas.

23. A foam molding apparatus according to any one of claims 12 to 22, wherein said injection means includes an injection nozzle for injection of the foamable material, said injection nozzle being adapted to be moved relative to the mold.

24. A foam molding method for foaming a foamable material, comprising the steps of:

providing a mold having a cavity;

providing a core member in the cavity of the mold;

placing the cavity of the mold under a pressurized condition;

foaming the foamable material in the cavity of the mold under the pressurized condition so that the foamable material adheres to the core member partway or all the way around a periphery of the core member, thus appropriately controlling foaming of the foamable material; and

releasing the pressurized condition of the cavity of the mold.

25. A foam molding method for foaming a foamable

material, comprising the steps of:

providing a mold having a cavity;

providing a casing in the cavity of the mold, said casing having a hollow structure with opposing open ends;

placing the cavity of the mold under a pressurized condition;

foaming the foamable material so as to fill a hollow portion of the casing, to thereby appropriately control foaming of the foamable material; and

releasing the pressurized condition of the cavity of the mold.

26. A foam molding apparatus comprising:

a mold having a cavity;

injection means capable of injecting a foamable material into the cavity of the mold;

a core member provided in the cavity of the mold so that the foamable material injected into the cavity of the mold adheres to the core member partway or all the way around a periphery of the core member;

pressurizing means adapted to pressurize the cavity of the mold; and

controlling means adapted to control a pressure in the cavity of the mold so as to control, at least around the periphery of the core member, foaming of the foamable material injected into the cavity of the mold by said injection means.

27. A foam molding apparatus, comprising:

a mold having a cavity;

injection means capable of injecting a foamable material into the cavity of the mold;

a casing having a hollow structure with opposing open ends, said casing being provided in the cavity of the mold so as to enable the foamable material injected into the cavity of the mold to be supplied into a hollow portion of the casing through the open ends of the casing;

pressurizing means adapted to pressurize the cavity of the mold; and

controlling means adapted to control a pressure in the cavity of the mold so as to control foaming of the foamable material supplied into the hollow portion of the casing by said injection means.

28. A foam molding method using, as a foamable material, a heat curable composition obtained by mechanically mixing a material to be foamed with gas by means of a piston pump, comprising the steps of:

providing a mold comprising a female mold half and a male mold half;

injecting the foamable material into the cavity of the female mold half and foaming the foamable material therein;

fitting the male mold half into the female mold half under a clamping force;

heating at least one of the female mold half and the male mold half, while the male mold half is fitted into the female mold half under the clamping force, to thereby cure a shaped foam obtained by foaming and shaping the

foamable material; and

removing the cured foam from the mold.

29. A foam molding method using, as a foamable material, a heat curable composition obtained by mechanically mixing a material to be foamed with gas by means of a piston pump, comprising the steps of:

providing a mold;

cooling the mold to a temperature equal to or lower than a predetermined level;

injecting the foamable material into a hermetically closed cavity of the mold that has been cooled;

allowing the foamable material to foam in the mold;

heating the mold and curing a shaped foam obtained by foaming; and

removing the shaped foam from the mold.

30. A foam molding method according to claim 29, wherein said injecting step and said allowing step include a step of controlling a pressure in the cavity of the mold by means of a vacuum pump.

31. A foam molding method using a foamable material obtained by mechanically mixing a material to be foamed with gas by means of a piston pump, comprising the steps of:

placing a mold with a cavity thereof being held in a hermetically closed state;

reducing a pressure in the cavity of the mold;

injecting, while reducing the pressure in the cavity of the mold, the foamable material in a predetermined

amount into the cavity of the mold, according to an expansion ratio of the foamable material;

allowing, while reducing the pressure in the cavity of the mold, the foamable material to foam in the cavity of the mold, to thereby obtain a shaped foam;

heat curing the shaped foam; and

removing the shaped foam from the mold.

32. A foam molding method using a foamable material obtained by mechanically mixing a material to be foamed with gas by means of a piston pump, comprising the steps of:

placing a mold with a cavity thereof being held in a hermetically closed state, said mold comprising a female mold half and a male mold half;

reducing a pressure in the cavity of the mold;

injecting, while reducing the pressure in the cavity of the mold, the foamable material in a predetermined amount into the cavity of the mold, according to an expansion ratio of the foamable material;

allowing, while reducing the pressure in the cavity of the mold, the foamable material to foam in the cavity of the mold;

moving the female mold half and the male mold half towards one another, and press forming, into a shaped foam, the foamable material that has foamed in the cavity of the mold;

heat curing the shaped foam; and

removing the shaped foam from the mold.

33. A foam molding method using a foamable material obtained by mechanically mixing a material to be foamed with gas by means of a piston pump, comprising the steps of:

placing a mold with a cavity thereof being held in a hermetically closed state, said mold comprising a female mold half and a male mold half;

reducing a pressure in the cavity of the mold;

injecting the foamable material in a predetermined amount into the cavity of the mold, according to an expansion ratio of the foamable material;

moving the female mold half and the male mold half apart from one another after injecting the foamable material into the cavity of the mold, thus foaming the foamable material while spreading the cavity of the mold, to thereby form a shaped foam;

heat curing the shaped foam; and

removing the shaped foam from the mold.

34. A foam molding method using a foamable material obtained by mechanically mixing a material to be foamed with gas by means of a piston pump, comprising the steps of:

providing a mold comprising a female mold half and a male mold half, with a cavity being formed therebetween;

pre-forming a core member in the cavity;

slightly opening the mold by moving the female mold half and the male mold half apart from one another after pre-forming the core member, to thereby separate at least

one of the female mold half and the male mold half from the core member to form a clearance in the cavity;

injecting the foamable material into the clearance and foaming the foamable material therein; and

curing the foamable material, to thereby form a shaped foam which covers a surface of the core member.

35. A foam molding method using a foamable material obtained by mechanically mixing a material to be foamed with gas, comprising the steps of:

providing a mold comprising a female mold half and a male mold half, with a cavity being formed therebetween;

injecting the foamable material into the cavity and foaming the foamable material therein;

curing the foamable material which has been foamed, thus pre-forming a core member from the foamable material;

moving the female mold half and the male mold half apart from one another after pre-forming the core member, to thereby slightly open the mold, thus separating at least one of the female mold half and the male mold half from the core member to form a clearance in the cavity; and

injecting a non-foamable material into the clearance, and forming a layer which covers a surface of the core member.